emissions of CDD/CDF are dependent on combustor type, with generally higher emissions from RDF units. As a result of formation mechanisms that are related to flue gas temperature, operation of an APCD may either increase or decrease CDD/CDF emissions.[6]

2.4 AIR POLLUTION CONTROL TECHNIQUES

Emissions from MWCs can be controlled through combustion/process modifications and application of add-on APCDs. This section discusses the effects of GCP, various APCDs, and control techniques used to treat MWC flue gas to reduce emissions.

Add S/UP S/down Mal Funct'

2.4.1 Good Combustion Practice

Good combustion practice is defined as MWC system design, operation, and maintenance techniques which, when applied with appropriate flue gas cleaning techniques, can increase combustion efficiency and minimize trace organic emissions. The GCP control strategy includes collectively applying a number of combustion conditions to achieve three broad goals:

(1) Maximize in-furnace destruction of organics;
(2) Minimize PM carryover out of the furnace; and
(3) Minimize low temperature reactions that promote formation of CDD/CDF.

There are three specific measurable parameters that compose a set of combustor operating conditions that can be related directly or indirectly to the GCP components. These three combustion parameters are:

- CO levels in the flue gas;
- Operating load; and
- PM control device inlet flue gas temperature.

Good combustion is associated with low emissions of CDD/CDF and other trace organics. As noted earlier, available emissions data indicate that CO is a good indicator of CDD/CDF emissions. The ability to maintain low CO and CDD/CDF concentrations in MWC flue gases is dependent on combustor design features and operation practices. A review of emissions data from MWCs indicates that design limitations may make it challenging for some combustor types to achieve CO emission levels that are routinely attained by other units. For example and as noted previously, semi-suspension-fired RDF systems may have more difficulty maintaining low CO levels than mass burn units due to the effects of carryover of incompletely combusted materials into low temperature portions of the boiler, and, in some cases, due to combustion control instabilities that result from fuel feeding characteristics.

2.4.2 Particulate Matter/Metals Control

The control of PM, along with metals that have adsorbed onto the PM, is most frequently accomplished through the use of control devices such as ESPs and fabric filters (FFs). Although other PM control technologies (e.g., cyclones, electrified gravel beds, venturi scrubbers) are available, they are seldom used on existing systems, and it is anticipated they will not be frequently used in future MWC systems. This section, therefore, focuses on ESP and FF design and performance.

2.4.2.1 Electrostatic Precipitators[11]

Electrostatic precipitators consist of a series of high-voltage (20 to 100 kV) discharge electrodes and grounded metal plates through which PM-laden flue gas flows. Negatively charged ions formed by this high-voltage field (known as a "corona") attach to PM in the flue gas, causing the charged particles to migrate toward and be collected on the grounded plates. The most common ESP types used by MWCs are: (1) plate-wire units in which the discharge electrode is a bottom-weighted or rigid wire, and (2) flat plate units, which use flat plates rather than wires as the discharge electrode. As a general rule, the greater the amount of collection plate area, the greater the ESP's PM collection efficiency.

In general, fly ashes with resistivities between 1×10^8 and 5×10^{10} ohm-cm and with a minimum of very fine particles (<1 μm)